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A research approach supporting micropropagation and domestication of blueberry (Vaccinium corymbosum L.) in Egypt

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Abstract

© 2018 Abuo El-Dis et al. The northern high bush blueberry, Vaccinium corymbosum L., is a North American species of blueberry, which has become a food crop of economic importance around the world. In the recent years, there has been an extended commercial interest for many wild species of Vaccinium products in Israel, Japan and New Zealand and of course Egypt. Nowadays a growing interest from NGOs and various research groups. They have participated in a concerted research action with cross counter disciplinary cooperation between plant physiology, population genetics, tree breeding, food science, and socioeconomics. Studies have been initiated in several countries on geographic variation of growth, adaptive and phenological traits. Unfortunately, until now, in Egypt we do not have enough studies to establishment of international provenance series, seed banks and studies of gene flow and phylogeographic variation of Vaccinium species. This paper presents part of our methods and reproducible protocols for clone propagation. The accumulated knowledge will be applied for a domestication strategy of Vaccinium corymbosum L. in Egypt. In addition, the outcome from this study will be guidelines for propagation and management of the germplasm of other Vaccinium species and resources.

Keywords

Domestication of blueberry, Food security, Micropropagation, Plant breeding, Vaccinium corymbosum L.

References

[1] Aida M, Beis D, Heidstra R, Willemsen V, Blilou I, Galinha C, Nussaume L, Noh Y-S, Amasino R, Scheres B (2004) The PLETHORA genes mediate patterning of the Arabidopsis root stem cell niche. Cell. 119(1): 109-120. https://doi.org/10.1016/j.cell.2004.09.018

[2] Beattie J, Crozier A, Duthie GG (2005) Potential health benefits of berries. Current Nutrition & Food Science. 1(1): 71-86. https://doi.org/10.2174/1573401052953294

[3] Benzie IF, Wachtel-Galor S (2011) Herbal medicine: biomolecular and clinical aspects. CRC Press. https://doi.org/10.1201/b10787-2

[4] CFIA (2015) D-02-04: The Blueberry Certification Program and domestic phytosanitary requirements to prevent the spread of blueberry maggot (Rhagoletis mendax) within Canada, 6th Revision, Effective Date: 1 June 2015. Retrieved from http://www.inspection.gc.ca/plants/plant-protection/directives/horticulture/d-02-04/eng/1320046578973/1320046655958

[5] Cohen D (1980) Application of micropropagation methods for blueberries and tamarillos. Application of micropropagation methods for blueberries and tamarillos. 30: 144-146.

[6] Duncan DB (1955) Multiple range and multiple F tests. Biometrics. 11(1): 1-42. https://doi.org/10.2307/3001478

[7] Geddes P, Le Blanc J, Yule W (1987) The blueberry maggot, Rhagoletis mendax (Diptera: Tephritidae), in eastern North America. Revue d'entomologie du Québec. 32(1-2): 16-24.

[8] Hallman GJ, Thomas DB (1999) Gamma irradiation quarantine treatment against blueberry maggot and apple maggot (Diptera: Tephritidae). Journal of Economic Entomology. 92(6): 1373-1376. https://doi.org/10.1093/jee/92.6.1373

[9] Kim Y-H, Bang CY, Won EK, Kim JP, Choung SY (2009) Antioxidant activities of Vaccinium uliginosum L. extract and its active components. Journal of medicinal food. 12(4): 885-892. https://doi.org/10.1089/jmf.2008.1127

[10] Leakey R, Akinnifesi F (2008) Towards a domestication strategy for indigenous fruit trees in the tropics. Indigenous fruit trees in the tropics: domestication, utilization and commercialization. CAB International, Wallingford, UK, in association with the World Agroforestry Centre, Nairobi, Kenya: 28-49.

[11] Neilson W, Wood G (1984) The blueberry maggot: distribution, economic importance, and management practices. in III International Symposium on Vaccinium Culture 165.

[12] Ostrolucká MG, Gajdošová A, Libiaková G, Hrubikova K, Bežo M (2007) protocol for micropropagation of selected Vaccinium spp, in Protocols for micropropagation of woody trees and fruits. Springer: 445-455.

[13] Ostrolucká MG, Libiaková G, Ondrußková E, Gajdoßová A (2004) In vitro propagation of In vitro Vaccinium species Vaccinium. Acta Universitatis Latviensis. 676: 207-676.

[14] Overvoorde P, Fukaki H, Beeckman T (2010) Auxin control of root development. Cold Spring Harbor perspectives in biology: a001537. https://doi.org/10.1101/cshperspect.a001537

[15] Snedecor GW, Cochran W (1967) Statistical methods, 593 pp. Iowa State Univ., Ames.

[16] Welch CR, Wu Q, Simon JE (2008) Recent advances in anthocyanin analysis and characterization. Current analytical chemistry, 4(2): 75-101. https://doi.org/10.2174/157341108784587795

[17] Zu XY, Zhang ZY, Zhang XW, Yoshioka M, Yang YN, Li J (2010) Anthocyanins extracted from Chinese blueberry (Vaccinium uliginosum L.) and its anticancer effects on DLD-1 and COLO205 cells. 123: 2714-2719.